USING RED FILES IN AN

AVID-BASED WORKFLOW

STEP-BY-STEP REFERENCE GUIDE

This guide details the steps required to move RED R3D files - the native recording format of the RED ONE camera - through an HD post production process using Avid® Media Composer® v3.0.5 or later or Avid Symphony™ v3.0.5 or later editing systems and Avid DS 10.2 or later for native 2K/4K conform. (see www.avid.com/RED for details).

For additional workflow information and a step by step guide for using ROCKETCINE-X accelerated by the REDROCKET card visit www.avid.com/RED

For a step by step guide to using Avid MetaFuze v2 visit www.avid.com/metafuze

For additional workflow information and tools visit **www.avid.com/RED**

REDrushes and REDCINE are available from **www.red.com/support**

OVERVIEW

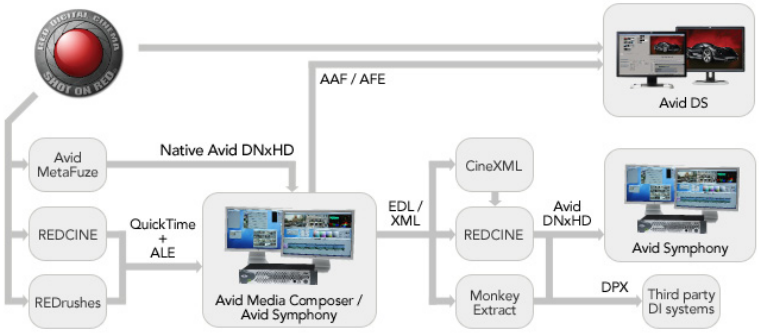
The RED Digital Cinema Company offers several applications that work natively with the R3D files created by the RED ONE camera. This step by step guide is for using the following software-only applications:

- REDrushes (Mac OS X only). REDrushes is part of the Red Alert application and installer.
- REDCINE (Mac OS X and Windows XP).

These software applications allow the opening, viewing, correction, and output of R3D files. The applications also have the ability to export metadata that can be used as part of a Media Composer workflow:

- REDCINE projects can be saved out in an XML format then converted to ALE.
- REDrushes can create an ALE file directly, preserving all of the metadata made available from the original R3D files.

The figure below shows the basic steps for using either REDrushes or REDCINE with Avid Media Composer.



For more information visit www.avid.com/red

REDRUSHES PROCESS

REDrushes release 3.3.8 and later will allow the creation of an ALE file as well as QuickTime reference files and put them into a single folder for easy organization. This creates a streamlined workflow when importing the ALE and QuickTime files into Media Composer or Symphony. REDrushes will export all the metadata extracted from the R3D files and preserve it through offline editorial to final conform.

See Appendix at end of document for metadata mapping into Avid editing products.

USING REDRUSHES TO CREATE ALE AND QT REFERENCE FILES

After installing REDrushes it will be available in the Application folder.

Launch the application and use the following steps:

1. Click the "Add Files" button and select the folder with the R3D files. It will also go through all the subfolders. All R3D files will appear in the main window. See Figures 1, 2 and 3.

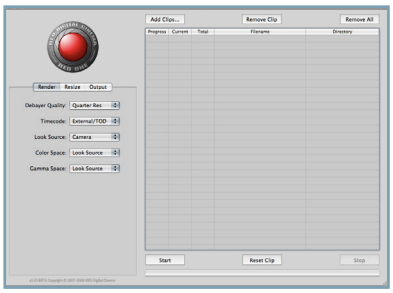


Figure 1

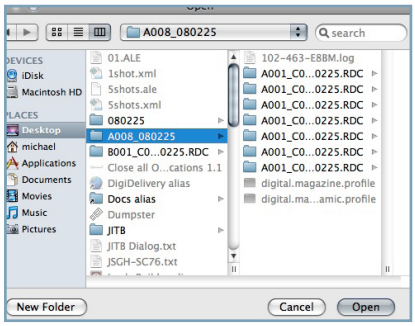


Figure 2

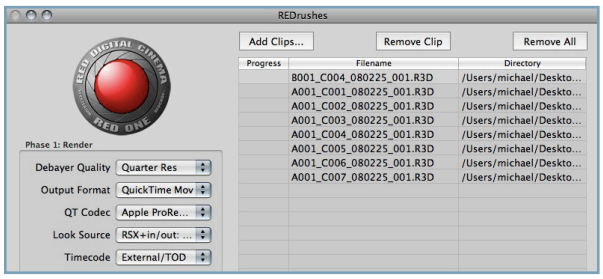


Figure 3

2. Select the output folder for the QT reference files and the ALE file. See Figure 4.

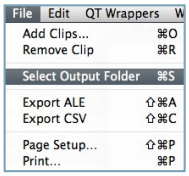


Figure 4

3. Make sure the following settings are set as seen in Figure 5:
   a. No Resolution EXT (_F, _H, etc.)
   b. Avid Compatible Audio (for Avid Media Composer versions prior to 3.2)

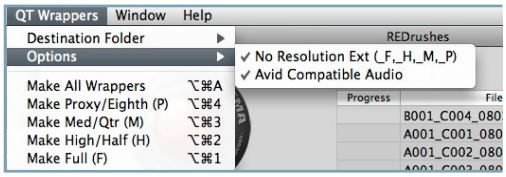


Figure 5

4. Transcode to QuickTime wrapped Avid DNxHD® based on the debayer chosen by the production. Figure 6.

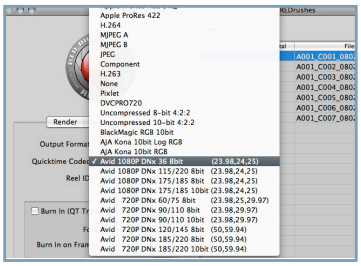


Figure 6

5. Go to File Menu and select "export ALE" as in Figure 7.

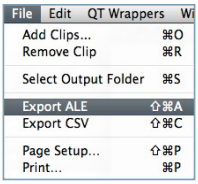


Figure 7

6. The Output Folder will now contain the ALE file and all the QuickTime wrapped Avid DNxHD files for the selected R3D files. These are now ready for fast import into the Avid Media Composer. See Figure 8.

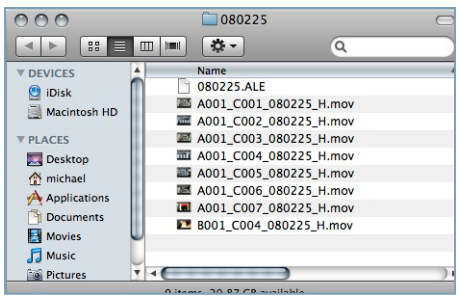


Figure 8

REDCINE PROCESS

The basic post process for using REDCINE in an Avid workflow is as follows:

1. Open all R3D files as needed. This will create a "construct" or what appears to be a timeline with all the shots.
2. Select frame rate, aspect ratio, metadata overlay as needed for the project.
3. Adjust color, crop and scale as needed.
4. Select Avid DNxHD as output. Select #C as the format to use for filename on export (Currently creates Avid DNxHD 175x only).
5. Save project as XML. When using the command "Save project as," type the project extension .xml rather than the native project extension of .rcn.

The XML will contain clip information for all of the events in the file. The XML conversion process also supports the "subclip" process in REDCINE where shorter spans than the original R3D file are used and exported. This is an example of a file with a single event:

```
<?xml version="1.0"?>
<Library name="RedMag">
    <resolution> 2048, 1024 </resolution>
    <fps> 24.000 </fps>
    <ShotList>
            <slot_name>""</slot_name>
        <Clip name="A001_C001_080225">
            <user>"666365CA-99A3-4C88-BF72-
D43CB3FCD58D"</user>
    <source>"/Users/michael/Desktop/R3D/A001_
C001_080225_001.R3D"</source>
            <reel_id>"A001"</reel_id>
            <length> 52 </length>
            <handles> 0, 51 </handles>
            <timecode>11:27:49:01</timecode>
            <offset> 45.000,-17.000 </offset>
            <scale> 113.440,113.440 </scale>
        </Clip>
    </ShotList>
</Library>
```

See Appendix at end of document to see how metadata from the REDCINE XML maps into Avid editing systems

REDCINE XSLT STEPS

Once the XML has been created, it needs to be translated to an Avid Log Exchange (ALE) file format.

The translation process from an XML file to an ALE file is done via an XSLT. XSLT stands for Extensible Stylesheet Language Transformations and is an XML-based language used in the transformation of XML files or documents into other XML or "human-readable" documents. During this process a new document is created while the original file remains unchanged. The new document, when processed, can be saved as another standard XML file or in another format, such as HTML or plain text.

When the REDCINE to ALE XSLT is applied to the XML file exported from REDCINE, it will create an ALE file. The process will map the metadata to existing Avid columns as appropriate as well as create custom columns in order to preserve the metadata for downstream processes. The ALE is then imported into Media Composer. The media is merged during the import process.

The Avid XSLT files for the processes below can be found at www.avid.com/RED.

There are freeware applications that allow you to process XML source files with an XSLT transformation for both Mac OS X and Windows XP/ Windows Vista. Two of them can be found here:

Windows: **XTrans**
http://www.simxtech.com/users/zc2/xtrans/XTrans.zip

Mac: **TestXSLT**
http://www2.entropy.ch/download/TestXSLT-3.1.zip

Applying a transform is very straightforward.
The steps for using TestXSLT for Mac are:

1. Launch application.
2. Once launched, and the XML tab active, drag and drop the REDCINE XML into the window as seen in Figure 9.

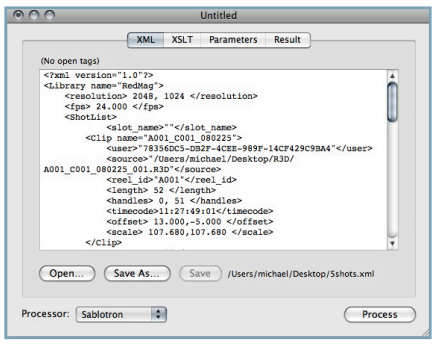


Figure 9

3. With the XSLT tab active, drag and drop the REDCINE_ALE.xsl file into the window as seen in Figure 10.

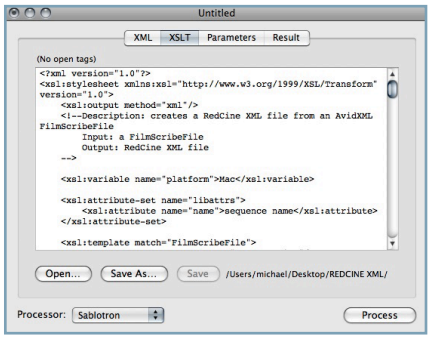


Figure 10

4. Click the "process" button and the resulting ALE file will appear in the window. See Figure 11.

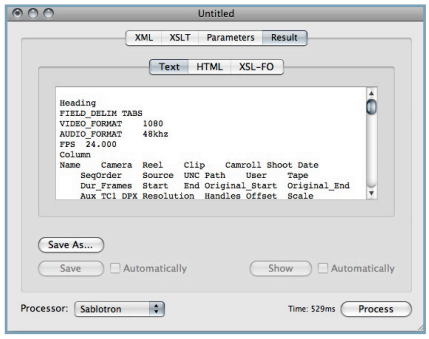


Figure 11

5. "Save As" and give it a name with the .ale extension.

Xtrans for the Windows platform works in a similar way:

1. Launch application.
2. Once launched, drag and drop the REDCINE XML into the window as seen in Figure 12.

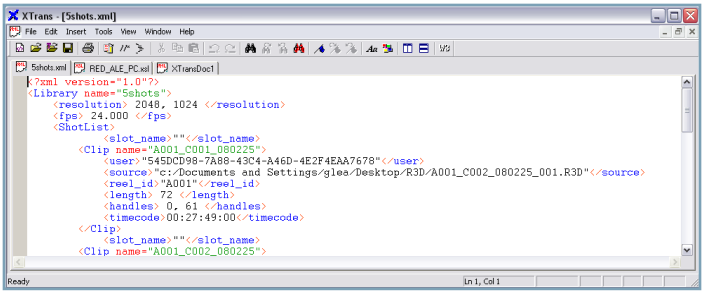


Figure 12

3. Drag and drop the REDCINE_ALE.xsl file into the window as seen in Figure 13.

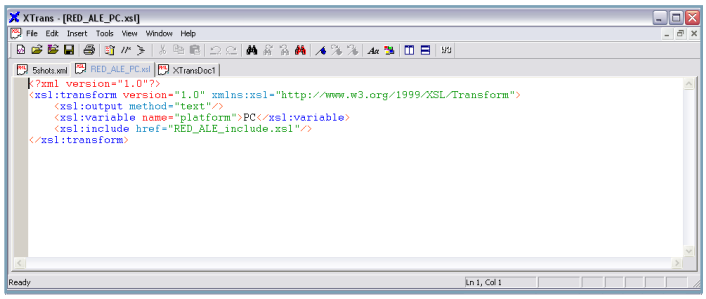


Figure 13

4. Doing a "ctrl-T" will result in an ALE file and appear in new window (Tools Menu/transform). See Figure 14.

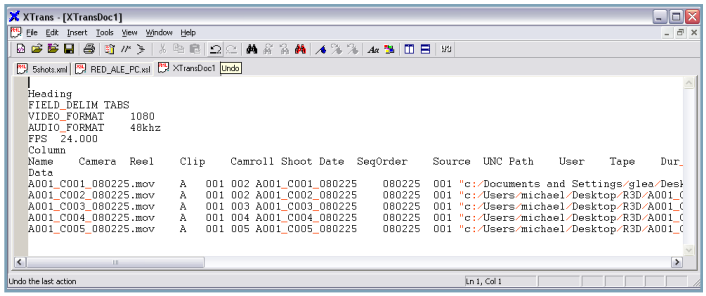


Figure 14

5. "Save As" and give it a name with the .ale extension.

MEDIA COMPOSER IMPORT ALE AND QUICKTIME FILES

Once the ALE and QuickTime files are made using the Avid QuickTime codec, the files are then imported into the Media Composer or Symphony editing system.

1. Import ALE (drag and drop into bin)

2. If QuickTime files have audio tracks, the V-only master clips need to have audio channels assigned. This is done via the "Clip/Modify" command.
   a. Select all clips. Select the "Modify" command from the "Clip" menu.
   b. From the dialog window, select "Tracks" from the pop up menu.
   c. Select number of audio tracks to match source and click OK. The "Tracks" column will now reflect the number of audio tracks to be imported.

If using REDrushes to create QuickTime wrapped Avid DNxHD or QuickTime references, REDrushes v.3.6 should be used. This version allows direct transcode to all Avid DNxHD data rates and fixes metadata issues associated with the ALE file creation in earlier REDrushes versions.

3. Highlight all offline clips and do a "batch import"

4. Select ALL in the batch import window (offline files) and navigate to the first QuickTime in source directory. See Figure 15.

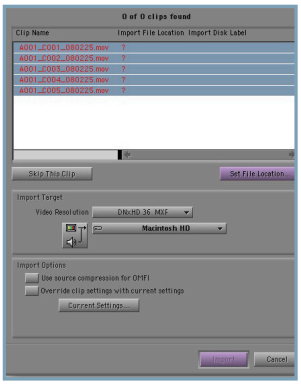


Figure 15

5. Select first QuickTime in target folder. See Figure 16.

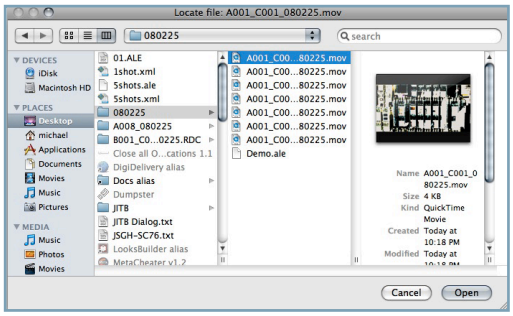


Figure 16

6. Select Avid DNxHD resolution, drive, and import. Be sure to set import options to resize and maintain for sources that were shot with a 2:1 aspect ratio. See Figure 17.

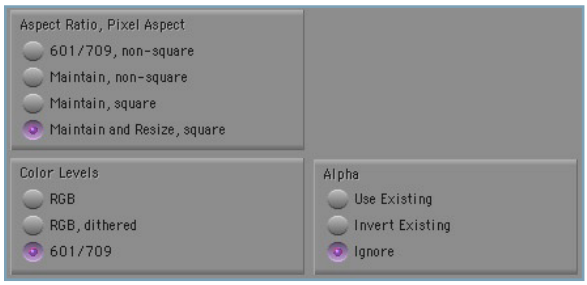


Figure 17

Source QuickTime files will merge with the metadata from ALE file for editorial. All sources can be tracked above the source and record monitors and then exported as an EDL or as a REDCINE XML pull list for conform downstream.

EXPORT OF EDL AND XML FILES FOR CONFORM

Output as EDL is done via Avid EDL Manager. Because the ALE import process maintained all metadata, output and source name can be chosen as needed by the conform station. A CMX EDL is a common format used in DI conform stations. For example, the DPX files generated by REDCINE will insert the Reel ID and Timecode into the header section of the file. Because the CMX 3600 file format cannot exceed 8 characters for tape name, the Reel portion of the file name (e.g., A001) as tracked in the Tape field of the Media Composer can be used as the source, as shown below in Figure 18.

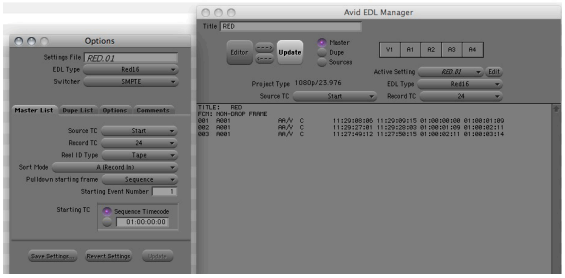


Figure 18

When using only the first four characters is too limiting, the full file name can be used as source in a modified EDL template called "Red16." This template will use the full 16 characters of the filename, creating a unique source for conform. As seen below in Figure 19, this is done by changing Reel ID type from "Tape" to "Cameraroll" since the full filename was placed in the Cameraroll column automatically during the REDCINE XML to ALE and REDrushes to ALE process.

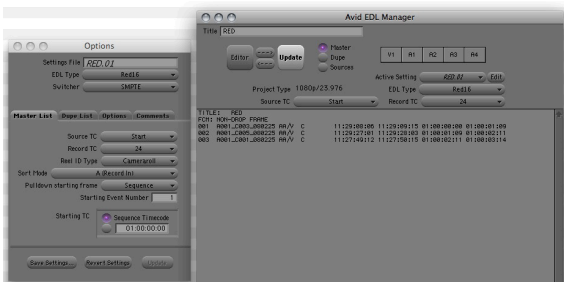


Figure 19

If the user needs R3D file "edgecode" timecode instead of time of day, change the Source TC in the main window from "Start" to "Auxiliary TC 1."

XML EXPORT WITH FILMSCRIBE

With Avid Media Composer v3.0.5 and later and Avid Symphony v3.0.5 and later, Avid FilmScribe™ (included with these releases) will export a master XML from the sequence for all layers. From the master XML, as with the REDCINE to ALE process, an XSLT is applied to this master file to create the REDCINE XML Pull List.

1. Open the bin containing the sequence in Avid FilmScribe.

2. Select XML from the template menu on the global pane. Select "Scan" as the list type. With the Global pane active, also make sure that "Separate List for Each Channel" is checked. There are no other settings; this will export all standard and custom columns as a master XML file. The Scan list type is a pull list for all elements in the timeline including effects and layers. Click on Preview and then Save As to create the XML file. See Figure 20.

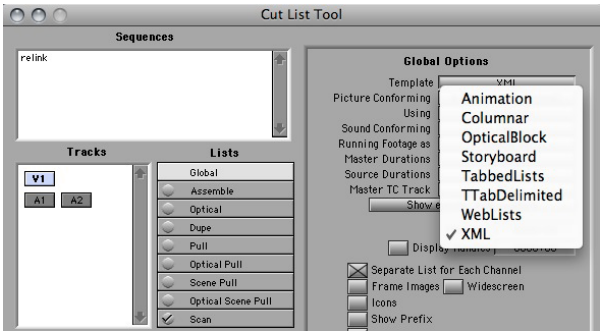


Figure 20

3. As with the ALE process described above in this guide, open either TestXSLT or Xtrans depending on platform.
   a. Load Master XML.
   b. Apply FS_Redcine.xls and process.
   c. Save file as <name>.xml. This will result in the XML file supported by REDCINE for import.

4. In REDCINE, load all source R3D files associated with the project. Load the XML file and it will result in just the sources needed to conform the sequence. Export as needed 2K, 4K, DPX, TIFF) for the conform station being used.

The Pull List as generated by the FS_Redcine.xls file exports all events and layers with only the number of frames needed (no duplication). The user will also have control over the number of frames desired for handles, resulting in maximum optimization of the pull list.

AVID DS CONFORM AND RELINK PROCESS

Avid DS provides the most complete conform via an AFE as a one step process from the offline sequence supporting layers, effects, and titles. Avid DS 10.2 allows direct linking to the R3D files for complete control over color and debayer quality, eliminating DPX as an interim step. Avid DS is the ideal choice for finishing a RED project because it is capable of mastering and outputting any format and resolution required by your project.

Considerations when using Avid DS 10.2:

- The folder to be indexed cannot contain any DPX files, only R3D files. The QuickTime proxies are filtered out during this process to avoid duplicate media.

- The frame rate of R3D files must be consistent in order for a conform to work. For example, all files must be 23.976 or 25, etc. No mixing of frame rates.

1. Launch DS 10.2. Create a new RED project to match the format of the R3D files. All presets for resolution and aspect ratio for RED can be found under the Film settings. See Figure 21. Once project type is created, navigate to the AFE file exported from Media Composer.

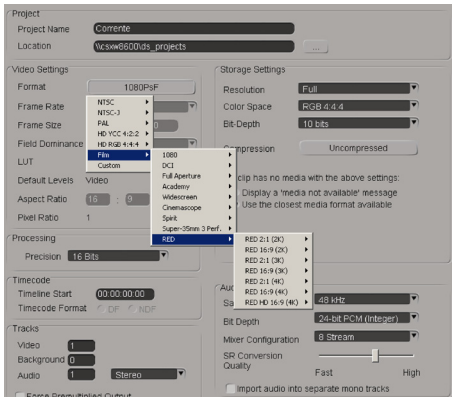


Figure 21

2. Double clicking the AFE exposes all its contents – not only the sequence itself, but all the sources used to make it. This is one of the reasons why AFE is much more powerful than EDLs. See Figure 22.

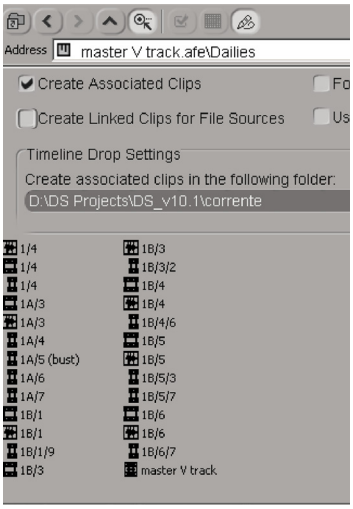


Figure 22

Once the AFE is open, locate the sequence. Highlight the sequence and check "Create Associated Clips," "Create Linked Clips for File Sources," and "Use Alternate Video Sources" "then choose "Configure." See Figure 23.

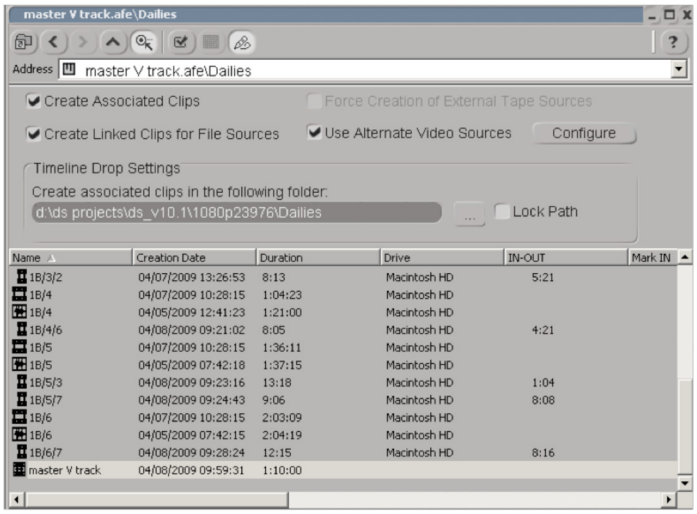

master V track.afe\Dailies
Address
master V track.afe\Dailies
Create Associated Clips
Force Creation of External Tape Sources
Create Linked Clips for File Sources
Use Alternate Video Sources
Configure
Timeline Drop Settings
Create associated clips in the following folder:
d:\ds projects\ds_v10.1\1080p23976\Dailies
Lock Path
Name
Creation Date
Duration
Drive
IN-OUT
Mark IN
1B/3/2 04/07/2009 13:26:53 8:13 Macintosh HD 5:21
1B/4 04/07/2009 10:28:15 1:04:23 Macintosh HD
1B/4 04/05/2009 12:41:23 1:21:00 Macintosh HD
1B/4/6 04/08/2009 09:21:02 8:05 Macintosh HD 4:21
1B/5 04/07/2009 10:28:15 1:36:11 Macintosh HD
1B/5 04/05/2009 07:42:18 1:37:15 Macintosh HD
1B/5/3 04/08/2009 09:23:16 13:18 Macintosh HD 1:04
1B/5/7 04/08/2009 09:24:43 9:06 Macintosh HD 8:08
1B/6 04/07/2009 10:28:15 2:03:09 Macintosh HD
1B/6 04/05/2009 07:42:15 2:04:19 Macintosh HD
1B/6/7 04/08/2009 09:28:24 12:15 Macintosh HD 8:16
master V track 04/08/2009 09:59:31 1:10:00

Figure 23

3. Navigate to the root level of the R3D files. Avid DS will index all subfolder and directories. Be sure there are no DPX files in this folder, only R3D files.

4. The Results pane will show all indexed R3D files (on the left) that will be used in the sequence conform. See Figure 24.

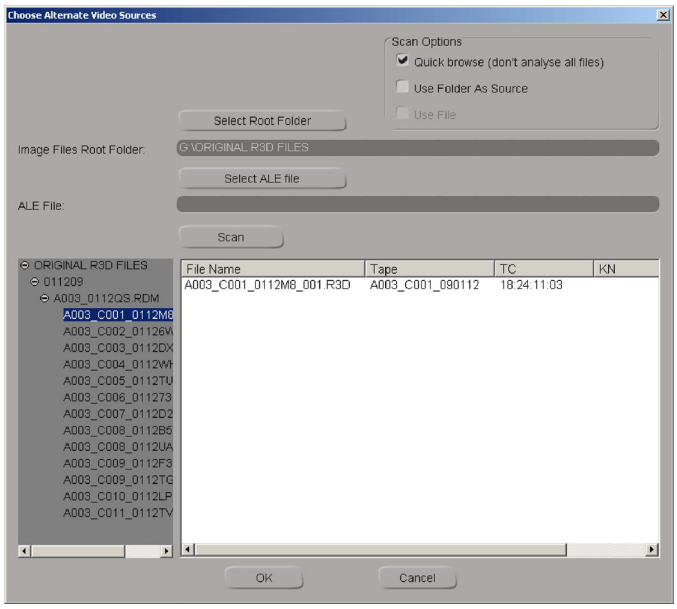


Figure 24

Clicking OK launches the Color Management window. R3D color and settings are controlled and laid out in a very similar fashion to Red Alert to allow ease of use and communication with the director of photography or person responsible for settings. At this time, the same RLX file that was used in the offline process can be used, or new settings can be created to prepare better color space for mastering. See Figure 25.

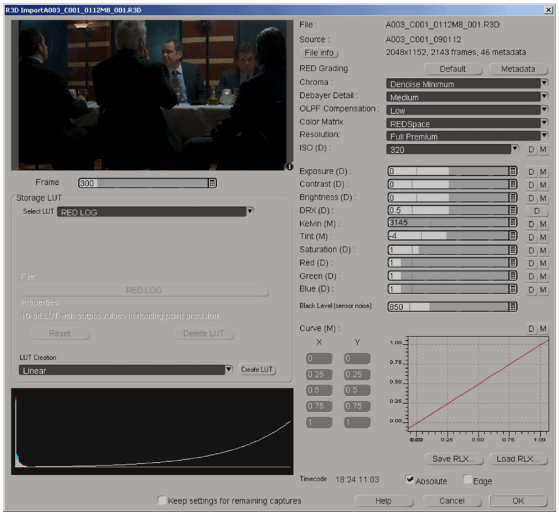


Figure 25

5. Once the settings have been loaded, drag the sequence onto your timeline and it will now point to the native R3D files fully conformed to the offline edit. See Figure 26.

Figure 26

If the user needs to change parameters on a given shot, clicking on the Avid DS Clip Properties of any clip can relaunch the color management settings pane for changes. See Figure 27.

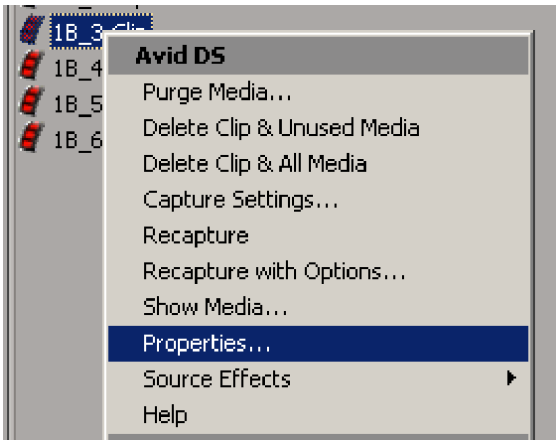


Figure 27

Once the Clip Properties window is open, go to the File Info tab and click on Format-Specific button.

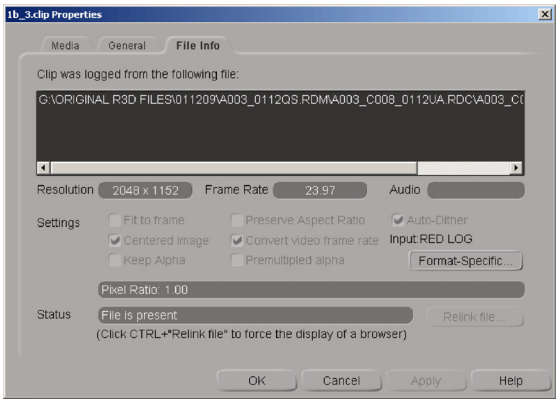


Figure 28

This will relaunch the R3D color and parameter control window as shown in step 4.

Once the conform has been checked via scroll or go to next edit (non real time), DS can then render to any desired output format – HD (with color LUT control) or DPX/TIFF in the case of a film out. Playback performance is based on the RED SDK.

DPX File Creation for DI Conform

- Creating DPX files for third party DI solution can be done using Monkey Frame Extract from Rubber Monkey Software. For more complicated sequences that go beyond the capabilities of an EDL, an FS_Scan_CMX.xsl file to create a "selects pull list" from layered sequences as a CMX 3600 EDL is available on the Avid Resources tab at www.avid.com/red.
- If creating DPX files via REDCINE and the .R3D files have changed location since the original REDCINE to ALE creation, or if the project was started with REDrushes or MetaCheater, the project can still use REDCINE to generate DPX or QuickTime wrapped Avid DNxHD files. This can be done by loading the FilmScribe XML output into cineXML to generate a re-indexed REDCINE XML file.
- Links to Monkey Frame Extract and cineXML applications can be found on the Third Party Resources tab of www.avid.com/red.

HD CONFORM OF R3D FILES IN AVID EDITING AND FINISHING PRODUCTS

The following additional steps need to be taken to bring back the selected clips as exported from REDCINE from a Pull List into an Avid editing system for finishing and mastering for HD and SD deliverables.

For the conform process in REDCINE, the R3D files must be in the original directories and drive path. REDCINE looks to the pathname <source> to create the new construct. Any changes to that pathname will prevent the XML Pull List from loading.

1. XML Pull List file has been loaded into REDCINE (per previous steps in "XML Export with FilmScribe" section of this guide) and all selects are part of a new construct.

2. Save project in order to create the new ALE of the selects.
   a. Open all R3D files as needed. This will create a "construct" or what appears to be a timeline with all the shots.
   b. Select frame rate, aspect ratio, metadata overlay as needed for the project.
   c. Adjust color, crop and scale as needed.

3. Select Avid DNxHD as output in the output tab of the application:
   a. Filename: #C
   b. Format: QuickTime
   c. Codec: DNxHD codec (Defaults to Avid DNxHD 175x)

4. Process all the selects as QuickTime-wrapped Avid DNxHD files.

5. Save project as XML. Using the command "Save project as," type the project extension .xml rather than the native project extension of .rcn.

6. Follow the steps outline above for merging QuickTime files into the resulting ALE.

7. In the Avid bin, combine the offline sequence as well as all the new selects just imported and "select all."

8. Go to Clip Menu and select "relink."

9. Set relink settings as shown in Figure 29.

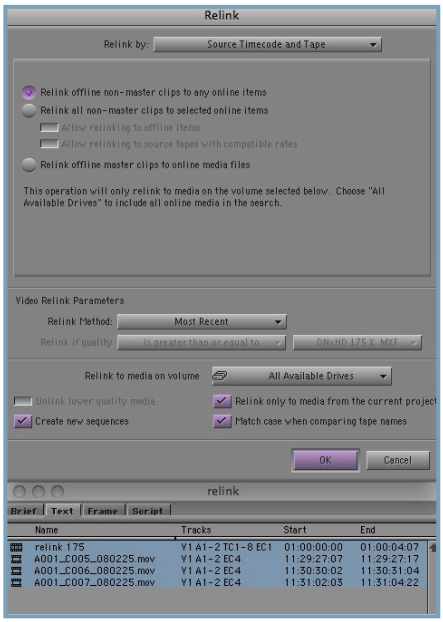


Figure 29

10. Click OK. A duplicate sequence will be created that now references the higher resolution media for final mastering. The relink process supports all layers and nests.

ADDITIONAL RESOURCES

The technology and workflow described in this reference guide are new and evolving. Improvements will continue over time and XSLTs will be updated. Be sure to check back to www.avid.com/RED for the latest information and tools for your Avid workflow.

For REDCINE and REDrushes downloads, FAQs, and additional support information, please visit the RED support page at www.red.com/support.

APPENDIX A: REDRUSHES METADATA MAPPING

REDRUSHES PROCESS

REDrushes release 3.3.8 and later will allow the creation of an ALE file as well as QuickTime reference files and put them into a single folder for easy organization. This creates a streamlined workflow when importing the ALE and QuickTime files into Media Composer or Symphony. REDrushes will export all the metadata extracted from the R3D files and preserve it through offline editorial to final conform.

Metadata from REDrushes maps in the following way:

Avid	Example of Imported Data	Comment
Frame Rate	24	This frame rate is added to the global
heading of the ALE file. Frame rate is	A001_C007_080225.mov	.mov added to filename to match QuickTime file for merge process.
defined in Redline from R3D file.	A001	Derived from first 4 characters of filename as per RED definition of filename
Name	A001_C007_080225.mov	.mov added to filename to match
QuickTime file for merge process.	007	Derived from characters 7-9 of filename as per RED definition of filename.
Tape	A001	Derived from first 4 characters of filename
as per RED definition of filename	11:31:09:09	Time of Day timecode at end of R3D file
Camera	A	Derived from characters 1st of filename
as per RED definition of filename.	V	Identification of tracks from R3D file V A1A2A3A4 total tracks
Clip	007	Derived from characters 7-9 of filename
as per RED definition of filename.	20080225	Shoot Date as defined within the R3D file metadata.
Start	11:30:53:05	Time of Day timecode at start of R3D file
End	11:31:09:09	Time of Day timecode at end of R3D file
Auxiliary TC1	01:00:38:14	Edgecode from R3D file
Tracks	V	Identification of tracks from R3D file V A1A2A3A4 total tracks

Avid	Example of Imported Data	Comment
DPX	A001_C007_080225-000000	Combination of filename as prefix and "-00000" as exported by RED ALERT
Shoot Date	20080225	Shoot Date as defined within the
R3D file metadata.	A001_C007_080225.mov	.mov added to filename to match QuickTime file for merge process.
Filename	A001_C007_080225	Name of file
TimeStamp	113054	From R3D file
FrameWidth	2048	From R3D file
FrameHeight	1024	From R3D file
ColorSpace	3	From R3D file/RED ALERT
Avid	Example of Imported Data	Comment
GammaSpace	1	From R3D file/ RED ALERT
Kelvin	5600.000000	From R3D file/ RED ALERT
Tint	0.000000	From R3D file/ RED ALERT
ISO Exposure	320	From R3D file/ RED ALERT
Saturation	0.000000	From R3D file/ RED ALERT
Contrast	0.000000	From R3D file/ RED ALERT
Brightness	0.000000	From R3D file/ RED ALERT

Avid	Example of Imported Data	Comment
GainGreen	1.000000	From R3D file/ RED ALERT
GainBlue	0.000000	From R3D file/ RED ALERT
Black X	0.000000	From R3D file/ RED ALERT
Black Y	0.000000	From R3D file/ RED ALERT
Toe X	0.32215	From R3D file/ RED ALERT
Toe Y	0.21429	From R3D file/ RED ALERT
Mid X	0.50000	From R3D file/ RED ALERT
Mid Y	0.50000	From R3D file/ RED ALERT
Knee X	0.75000	From R3D file/ RED ALERT
Knee Y	0.75000	From R3D file/ RED ALERT
White X	1.00000	From R3D file/ RED ALERT
White Y	1.00000	From R3D file/ RED ALERT
Camroll	A001_C007_080225	Added as additional metadata allowing flexibility in EDL generation from 4 characters (see Tape) to full 16
UNC	/Users/michael/Desktop/A008_080225/A001_C007_080225.RDC/A001_C007_080225_001.R3D	UNC field in Media Composer is a live hyperlink. Control-Click in this field will take user to directory containing the R3D file.

APPENDIX B: REDCINE METADATA MAPPINGS

Metadata from the REDCINE XML maps into the Avid editing system in the following way:

Avid	RED	Example of Imported Data	Comment
Frame Rate	From Red	24	This frame rate is added to the global heading of the ALE file. Frame rate is defined in RedCine.
Name	<Clip name=	A001_C001_080225.mov	mov added to filename to match QuickTime file for merge process.
Camera		A	Derived from first character of filename as per RED definition of filename
Reel		001	Derived from characters 2-4 of filename as per RED definition of filename.
Clip		001	Derived from characters 7-9 of filename as per RED definition of filename.
Camroll		A001_C001_080225	Added as additional metadata allowing flexibility in EDL generation from 4 characters (see Tape) to full 16
Avid	RED	Example of Imported Data	Comment
Shoot Date		080225	6 character representation of Shoot date and unique ID. MMDD** (Month/Day) where ** is a random alphanumeric pair. This is to insure against mistakes on set with duplicate rolls. This is taken from the file name.
SeqOrder		001	Derived form order in XML matching order of Construct from REDCINE as exported.
Source	<source>	"/Users/michael/Desktop/R3D/A001_C001_080225_001.R3D"	Location of original R3D file as used by RED. Also mapped to UNC.
UNC	<source>	"/Users/michael/Desktop/R3D/A001_C001_080225_001.R3D"	UNC field in Media Composer is a live hyperlink. Control-Click in this field will take user to directory containing the R3D file.
Tape	<reel_id>	A001	Source used in export of DPX files as well as defined by RED.
Dur_Frames	<length>	52	
Start	<timecode>	11:27:49:01	Time of Day timecode propagated through REDCINE as defined in camera during production.
End		11:27:51:04	Timecode calculated based on <timecode> field + <length>

Avid	RED	Example of Imported Data	Comment
Original_Start	Start	11:27:49:01	Duplicated from Start field as found in <time-code> field of file. Used to preserve original master timecode in case of consolidate or decompose of clips in Media Composer.
Original_End	End	11:27:51:04	Duplicated from End field. Used to preserve original master timecode in case of consolidate or decompose of clips in Media Composer.
Aux TC1		01:00:00:00	Red camera edgecode timecode inserted and assumed as 01:00:00:00 for first frame of clips as per camera functionality.
DPX		A001_C001_080225-0099045	Combination of filename as prefix and conversion of <timecode> field to total frames based on frame rate of source file. Allows for predictable and consistent file naming when moving to sequential file based formats
Handles	<handles>	0, 51	Both values are offsets from start of file. Handles will also display if only select spans were used from the original R3D file (subclips
Offset	<offset>	45.000,-17.000	X and Y offsets as defined in REDCINE.
Scale	<scale>	113.440,113.440	Scale values of X and Y as defined in REDCINE.

All of the above fields of metadata will be available on a per event basis in Media Composer and Symphony. It is recommended that after the first import a view of the bin be saved with these headings. This way, if needed, the user can confirm and view the metadata at any time.

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